ELECTRICAL AND ELECTRONIC ENGINEERING COURSES

PH1012 PHYSICS A
[Academic Units: 4.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39 hr ; Tut: 12 hrs]

EE0001 EFFECTS OF ELECTROMAGNETIC RADIATION ON HUMANS
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39 hrs]

EE1002 PHYSICS FOUNDATION FOR ELECTRICAL & ELECTRONIC ENGINEERING NEW
[Academic Unit: 4.0 ; Pre-requisite: FE1012/FE0001; Contact Hours: Seminars: Lec: 39 hr ; Tut: 12 hrs]
Introduction to electromagnetic fields and applications. Electromagnetic in electronics, circuits and communications. Introduction to light, lasers and optical spectroscopy. Principles of geometric and wave optical components. Introduction to quantum physics and applications. Applications of quantum physics in electronics and lasers.

EE2001 CIRCUIT ANALYSIS
[Academic Units: 4.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39 hrs ; Tut: 12 hrs]

EE2002 ANALOG ELECTRONICS
[Academic Units: 4.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39hrs ; Tut: 12 hrs]

EE2003 SEMICONDUCTOR FUNDAMENTALS
[Academic Units: 4.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39 hrs ; Tut: 12 hrs]

EE2004 DIGITAL ELECTRONICS
[Academic Units: 4.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39 hrs ; Tut: 12 hrs]
Number systems and logic gates. Boolean algebra and logic minimization. Combinational logic design and msi digital devices. Sequential logic elements. Synchronous sequential logic circuits. Programmable logic devices and memories.

EE2006 ENGINEERING MATHEMATICS I
[Academic Units: 4.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39 hrs ; Tut: 12 hrs]

EE2007 ENGINEERING MATHEMATICS II
[Academic Units: 4.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 39 hrs ; Tut: 12 hrs]

EE2008 DATA STRUCTURES AND ALGORITHMS
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

**EE2010 SIGNALS AND SYSTEMS**
[Academic Units: 4.0; Pre-requisite: Nil; Contact Hours: Lec: 396 hrs; Tut: 12 hrs]

**EE2071 LABORATORY 2A**
[Academic Units: 1.0; Pre-requisite: Nil; Contact Hours: Lab: 39 hrs]
Laboratory experiments to provide practical application and understanding of theories relating to electrical engineering fundamentals.

**EE2072 LABORATORY 2B**
[Academic Units: 1.0; Pre-requisite: Nil; Contact Hours: Lab: 39 hrs]
Laboratory experiments to provide practical application and understanding of theories relating to electrical engineering fundamentals.

**EE2073 INTRODUCTION TO ENGINEERING DESIGN AND PROJECT**
[Academic Units: 2.0; Pre-requisite: Nil; Contact Hours: Lec: 6 hrs; Lab: 33 hrs]

**MH2810 MATHEMATICS A**
[Academic Units: 4.0; Pre-requisite: Nil; Contact Hours: Lec: 39 hrs; Tut: 12 hrs]

**HW0210 TECHNICAL COMMUNICATION**
[Academic Units: 2.0; Pre-requisite: Nil; Contact Hours: Tut: 24 hrs]

**EE3001 ENGINEERING ELECTROMAGNETICS**
[Academic Units: 4.0; Co-requisite: EE2007; Contact Hours: Lec: 39 hrs; Tut: 12 hrs]

**EE3002 MICROPROCESSORS**
[Academic Units: 3.0; Pre-requisite: Nil; Contact Hours: Lec: 26 hrs; Tut: 12 hrs]
Microprocessor fundamentals. Assembly language programming. I/O interfacing. Protected mode operation.

**EE3010 ELECTRICAL DEVICES AND MACHINES**
[Academic Units: 3.0; Pre-requisite: 2001; Contact Hours: Lec: 26 hrs; Tut: 12 hrs; Lab: 6 hrs]
Electromagnetic Principles and Actuators. Transformers. DC Machines. AC Machines.

**EE3011 MODELLING AND CONTROL**
[Academic Units: 3.0; Pre-requisite: 2006; Contact Hours: Lec: 26 hrs; Tut: 12 hrs; Lab: 3 hrs]

**EE3012 COMMUNICATION PRINCIPLES**
[Academic Units: 3.0; Pre-requisite: 2001; Contact Hours: Lec: 26 hrs; Tut: 12 hrs; Lab: 3 hrs]

EE3013 SEMICONDUCTOR DEVICES AND PROCESSING
[Academic Units: 3.0 ; Pre-requisite: 2003 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs ; Lab: 3 hrs]

EE3014 DIGITAL SIGNAL PROCESSING
[Academic Units: 3.0 ; Pre-requisite: 2010 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs ; Lab: 3 hrs]

EE3015 POWER SYSTEMS AND PROTECTION
[Academic Units: 3.0 ; Pre-requisite: 2001 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs ; Lab: 3 hrs]

EE3017 COMPUTER COMMUNICATIONS
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs ; Lab: 3 hrs]
Academic Units: 3
Introduction to computer communications. Data Communications Fundamentals. Data Link Control. Local Area Networks. Internetworking.

EE3019 INTEGRATED ELECTRONICS
[Academic Units: 3.0 ; Pre-requisite: 2002 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs ; Lab: 3 hrs]

EE0040 ENGINEER AND SOCIETY
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]
The course comprises 4 main topics: Evolution of Modern Singapore; Technology & Society; Ethics and Professionalism and The Environment. The students are made aware of “Current Issues” at the time of their study.

EE4XXX BUSINESS AND MANAGEMENT
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]
Using case studies and current events to: understanding individual and group behavior in organizations: the impact of globalization, continuous learning, work values and corporate culture; visionary and transformational leadership strategies: motivation, teambuilding and talent development, ethical behavior and integrity; Managing work groups:organizational communications and conflict resolution strategies, leveraging on diversity; Quality and excellence concepts: stakeholders awareness, customer-centred mindset, people-centred management approaches, innovative adaptation to continuous change, learning organization, global talent search; Trade unions, collective bargaining and labour-management relations challenges and prospects.

EE4080 FINAL YEAR PROJECT
[Academic Units: 8.0 ; Pre-requisite: Year 4 standing]
Projects may include, but are not limited to, one or more of the following areas: design, product development, software development, laboratory investigation, computing and analysis, field testing and instrumentation and feasibility studies. Besides project proposals generated by its own
academic staff, the school also works with outside partners including the A*STAR Research Institutes and industrial companies to propose relevant projects.

**EE4105 CELLULAR COMMUNICATION SYSTEM DESIGN**  
[Academic Units: 2.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]  
The students will be involved in the planning and design of cellular and wireless personal communication systems at the system level. Issues such as the choice of modulation and channel coding schemes as well as multiple access methods will be dealt with. Fundamentals of digital signal processing will be briefly introduced. DSP techniques used in the design of baseband digital signal transmission and reception will be covered. Carrier-modulated signals, such as AM, QAM and PSK signals, used for transmission through band-pass channels will be discussed. Channel equaliser design for compensation of channel distortions and inter-symbol interference (ISI) will be dealt with.

**EE4110 OPTICAL COMMUNICATION SYSTEM DESIGN**  
[Academic Units: 2.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]  
Students will be involved in the design of fibre optic communication systems. Issues such as light propagation, fibre characteristics and classification, fibre cables, connectors and splices, optical transmitters and receivers, optical amplifier and filter, optical coupler and wavelength converter, nonlinear effects in WDM systems, and system design methodology are covered.

**EE4152 DIGITAL COMMUNICATIONS**  
[Academic Units: 3.0 ; Pre-requisite: EE3012 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]  

**EE4153 TELECOMMUNICATION SYSTEMS**  
[Academic Units: 3.0 ; Pre-requisite: EE3012 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]  
Telecommunication networks. Switching and signaling. Line transmission. Microwave communication systems. Optical fibre communication systems and applications.

**EE4188 WIRELESS COMMUNICATIONS**  
[Academic Units: 3.0 ; Pre-requisite: EE3012 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]  

**EE4207 CONTROL ENGINEERING DESIGN**  
[Academic Units: 2.0 ; Semester(s): 1 or 2 ; Pre-requisite: Nil ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]  

**EE4208 INTELLIGENT SYSTEM DESIGN**  
[Academic Units: 2.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]  
This module covers the design of intelligent systems such as intelligent automation systems, neurofuzzy systems and intelligent vision systems. Currently, the focus is on the design of computer vision systems.

**EE4265 PROCESS CONTROL SYSTEMS**  
[Academic Units: 3.0 ; Pre-requisite: EE3011 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]  

**EE4266 COMPUTER VISION**

EE4268 ROBOTICS AND AUTOMATION
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4303 MIXED-SIGNAL IC DESIGN
[Academic Units: 2.0 ; Pre-requisite: EE3003 ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]
Mixed-Signal design. Design practice.

EE4305 DIGITAL DESIGN WITH HDL
[Academic Units: 2.0 ; Pre-requisite: EE2004 ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]
Digital design using hardware description language. Design practice.

EE4340 VLSI SYSTEMS
[Academic Units: 3.0 ; Pre-requisite: EE2004 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4341 ADVANCED ANALOG CIRCUITS
[Academic Units: 3.0 ; Pre-requisite: EE3003 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4344 ANALYSIS AND DESIGN OF INTEGRATED CIRCUITS
[Academic Units: 3.0 ; Pre-requisite: EE3003 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4503 POWER ENGINEERING DESIGN
[Academic Units: 2.0 ; Pre-requisite: EE3015 ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]
In this design course, the students will apply the concepts of various power system analysis techniques and system performance criteria in designing a medium/low voltage transmission system and protection schemes for some typical industrial distribution networks. Students are required to carry out the detailed design with hands-on exercise and extensive use of computer simulation software. Students are also required to verify the results of the final design to meet specifications.

EE4504 DESIGN OF CLEAN ENERGY SYSTEMS
[Academic Units: 2.0 ; Pre-requisite: EE3015 ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]

EE4530 POWER SYSTEM ANALYSIS AND CONTROL
[Academic Units: 3.0 ; Pre-requisite: EE3010 & EE3015 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]
Power flows, Active power and frequency control. Reactive power and voltage control. Power system stability.
EE4532 POWER ELECTRONICS AND DRIVES
[Academic Units: 3.0 ; Pre-requisite: EE2005 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4534 MODERN DISTRIBUTION SYSTEMS WITH RENEWABLE RESOURCES
[Academic Units: 3.0 ; Pre-requisite: EE3015 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4717 WEB APPLICATION DESIGN
[Academic Units: 2.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]
This design course will equip students with principles, knowledge and skills for the design and construction of web-enabled Internet applications. It deals with challenges raised in wide-area distributed computing, including persistence, concurrency and transaction, as well as technologies for creating, managing, and tracking web interaction state in the environments where the connections are inherently unreliable and protocols are inherently stateless.

EE4718 ENTERPRISE NETWORK DESIGN
[Academic Units: 2.0 ; Pre-requisite: EE3017 ; Contact Hours: Lec: 12 hrs ; Lab: 26 hrs]
This course covers network technologies and protocols, network planning and design methodologies. Besides acquiring the theoretical background in enterprise networking, students will learn to set up, configure and interconnect an IP network in the lab sessions. Network monitoring and management tools will also be introduced to the students.

EE4758 COMPUTER SECURITY
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4761 COMPUTER NETWORKING
[Academic Units: 3.0 ; Pre-requisite: EE3017 ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

EE4791 DATABASE SYSTEMS
[Academic Units: 3.0 ; Pre-requisite: Nil ; Contact Hours: Lec: 26 hrs ; Tut: 12 hrs]

HW0310 PROFESSIONAL COMMUNICATION
[Academic Units: 2.0 ; Pre-requisite: HW001 ; Contact Hours: Lec: 12 hrs ; Tut: 12 hrs]

Contact Hours = per week